AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-5.   (canceled)

6.   (currently amended) An audio/video recording apparatus for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium ~~(21)~~, recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium so that the reproduction sequence can be designated, comprising:

audio encoding means ~~(24 (11, 12, 13))~~ that performs encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputs the audio data;

video data changing means that changes the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

edition point determining means that determines an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames, a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

multiplexing means ~~(24)~~ that multiplexes the audio data and the video data to generate the video object;

control means ~~(24, 26)~~ that controls the multiplexing means ~~(24)~~ so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one

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audio frame from the upper limit of a specific audio buffer size, and generates a flag indicative of an audio multiplex state at the time of multiplexing by the multiplexing means (24); and

recording means (23) that records the video object output from the multiplexing means (24) controlled by the control means (24, 26) onto the recording medium (21) together with a flag indicative of the audio multiplex state generated by the control means (24, 26).

7.   (currently amended) An audio/video recording apparatus for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (21), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (21) so that the reproduction sequence can be designated, comprising:

audio encoding means (24 (11, 12, 13)) that performs encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputs the audio data;

video data changing means that changes the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

edition point determining means that determines an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames, a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

multiplexing means (24) that multiplexes the audio data and the video data to generate the video object;

control means (24, 26) that controls the multiplexing means (24) so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one

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audio frame from the upper limit of a specific audio buffer size, and generates a flag indicative of an audio multiplex state at the time of multiplexing by the multiplexing means (~~24~~);

first recording means (~~23~~) that records the video object output from the multiplexing means (~~24~~) controlled by the control means (~~24, 26~~) onto the recording medium (~~21~~) together with a flag indicative of the audio multiplex state generated by the control means (~~24, 26~~);

~~video data changing means (27, 24, 23) that changes the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;~~

~~means (26) that determines an edition point in an audio frame so that a period of reproducing an audio frame of a video object and a period of reproducing an audio frame in the following video object partly overlap each other around the connection point and edits the audio frames;~~ and

second recording means (~~23~~) that records the edition point <u>in the audio frame</u> as registration information onto the recording medium (~~21~~).

8.   (currently amended) An audio/video recording method of, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (~~21~~), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium so that the reproduction sequence can be designated, comprising:

a first step of performing encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputting the audio data;

<u>a second step of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;</u>

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a third step of determining an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames, a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

a ~~second~~ fourth step (S22) of controlling so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size at the time of multiplexing the audio data and the video data; and

a ~~third~~ fifth step (S23) of recording a flag indicative of an audio multiplex state under control of the ~~second~~ fourth step (S22) onto the recording medium (21) together with the video object obtained by multiplexing under the control of the ~~second~~ fourth step (S22).

9.   (currently amended) An audio/video recording method of, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (21), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (21) so that the reproduction sequence can be designated, comprising:

a first step of performing encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputting the audio data;

a second step of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

a third step of determining an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the

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connection point of the video frames, a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

a ~~second~~ fourth step ~~(S22)~~ of controlling so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size at the time of multiplexing the audio data and the video data;

a ~~third~~ fifth step ~~(S23)~~ of recording a flag indicative of an audio multiplex state under control in the ~~second~~ fourth step ~~(S22)~~ onto the recording medium ~~(21)~~ together with the video object obtained by multiplexing under control of the ~~second~~ fourth step ~~(S22)~~;

~~a fourth step (S2) of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;~~

~~a fifth step (S3) of determining an edition point in an audio frame so that a period of reproducing an audio frame of a video object and a period of reproducing an audio frame in the following video object partly overlap each other around the connection point and editing the audio frames; and~~

a sixth step ~~(S4)~~ of recording the edition point in the audio frame as management information onto the recording medium ~~(21)~~.

10. (currently amended) An audio/video reproducing apparatus for reproducing video data and audio data on the basis of reproduction management information from a recording medium (31) on which a video object and management information including an edition point in an audio frame and a flag indicative of an audio multiplex state are [[is]] recorded by a recording apparatus according to claim 7, comprising:

overlap time calculating means (38) that calculates time of overlap between an audio frame to be reproduced last in a video object and an audio frame to be reproduced first in the following video object with respect to an edition point in the reproduction management information;

offset time calculating means (39) that sets the calculated overlap time as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the edition point is the first connection point in a designated reproduction sequence, calculates a value obtained by adding the calculated overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the edition point is any of the second and subsequent connection points in the reproduction sequence, and outputs an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection under a predetermined condition;

resetting means (37) that resets a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

offset means (37, 35) that offsets PTS of an audio frame read reproduced from the recording medium (31) in accordance with the calculated audio PTS offset time;

video data reproducing means (34) that reproduces video data reproduced from the recording medium (31) in accordance with video PTS accompanying the video data;

audio frame reproducing means (35) that reproduces an audio frame reproduced from the recording medium (31) in accordance with the offset PTS and, when the audio drop flag shows

the predetermined value, controls so as not to reproduce an audio frame to be reproduced last in the video object; and

audio decoding means (35 (15, 16, 17)) that performs decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio frame reproduced by the audio frame reproducing means (35) and outputs an audio signal.

11.   (currently amended) The audio/video reproducing apparatus according to claim 3 or 10, wherein when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of audio frame time, the offset time calculating means (39) calculates a value obtained by subtracting the audio frame period from the audio PTS offset time as final audio PTS offset time, and outputs an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection.

12.   (currently amended) An audio/video reproducing method for reproducing video data and audio data on the basis of reproduction management information from a recording medium (31) on which a video object and management information including an edition point in an audio frame and a flag indicative of an audio multiplex state are is recorded by a recording method according to claim 9, comprising:

a first step (S12) of calculating time of overlap between an audio frame to be reproduced last in a video object and an audio frame to be reproduced first in the following video object with respect to an edition point in the reproduction management information;

a second step (S12) of setting the calculated overlap time as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the edition point is the first connection point in a designated reproduction sequence, calculating a value obtained by adding the calculated overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the edition

point is any of the second and subsequent connection points in the reproduction sequence, and outputting an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection under a predetermined condition;

a third step (S13) of resetting a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

a fourth step (S13) of offsetting PTS of an audio frame read reproduced from the recording medium (31) in accordance with the audio PTS offset time calculated in the second step (S12);

a fifth step (S14) of reproducing video data that is reproduced from the recording medium (31) in accordance with video PTS accompanying the video data;

a sixth step (S14, S15) of reproducing an audio frame that is reproduced from the recording medium (31) in accordance with the PTS which is offset in the fourth step (S13) and, when the audio drop flag that is output in the third step (S13) shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

a seventh step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio frame reproduced in the sixth step (S14 and S15) and outputting an audio signal.

13.   (currently amended) The audio/video reproducing method according to claim 4 or 12, wherein in the second step (S12), when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of audio frame time, a value obtained by subtracting the audio frame period from the audio PTS offset time is calculated as final audio PTS offset time, and an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection is output.

14.   (currently amended) An audio/video reproducing program for making a computer execute a reproducing method of reproducing video data and audio data on the basis of reproduction management information from a recording medium (31) on which <u>a video object and</u> management information including <s>a video object,</s> an edition point in an audio frame[[,]] and <u>a flag indicative of</u> an audio multiplex state <s>is</s> <u>are</u> recorded by a recording method according to claim 9, wherein the program makes a computer execute:

        a first step <s>(S12)</s> of calculating time of overlap between an audio frame to be reproduced last in a video object and an audio frame to be reproduced first in the following video object with respect to an edition point in the reproduction management information;

        a second step <s>(S12)</s> of setting the calculated overlap time as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the edition point is the first connection point in a designated reproduction sequence, calculating a value obtained by adding the calculated overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the edition point is any of the second and subsequent connection points in the reproduction sequence, and outputting an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection under a predetermined condition;

        a third step <s>(S13)</s> of resetting a system time clock <s>(STC)</s> of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

        a fourth step <s>(S13)</s> of offsetting PTS of an audio frame <s>read</s> <u>reproduced</u> from the recording medium (31) in accordance with the audio PTS offset time calculated;

        a fifth step <s>(S14)</s> of reproducing video data that is reproduced from the recording medium (31) in accordance with video PTS accompanying the video data;

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a sixth step (S14, S15) of reproducing audio data that is reproduced from the recording medium (31) in accordance with the PTS which is offset in the fourth step (S13) and, when the audio drop flag that is output in the third step (S13) shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

a seventh step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio frame reproduced in the sixth step (S14, S15) and outputting an audio signal.

15. (currently amended) An audio/video recording apparatus for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (41), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (41) so that the reproduction sequence can be designated, comprising:

audio encoding means (44 (11, 12, 13)) that performs encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputs the audio data;

video data changing means (48, 44, 43) that changes the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

edition point determining means (46) that determines an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames, and a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

multiplexing means that multiplexes the audio data and the video data to generate the video object;

control means that controls the multiplexing means so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size, and generates a flag indicative of an audio multiplex state at the time of multiplexing by the multiplexing means;

overlap time calculating means (47) for calculating time of overlap between the audio frame to be reproduced last and the audio frame to be reproduced first so as to include the connection time; and

recording means (43) that records the video object output from the multiplexing means controlled by the control means onto the recording medium together with a flag indicative of the audio multiplex state generated by the control means, and records at least the overlap time as management information onto the recording medium (21).

16.   (currently amended) An audio/video recording method of, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (41), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (41) so that the reproduction sequence can be designated, comprising:

a first step of performing encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputting the audio data;

a second step (S42) of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

a third step (S3) of determining an edition point in an audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames and a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the

period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

a fourth step of controlling so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size at the time of multiplexing the audio data and the video data;

a ~~fourth~~ fifth step ~~(S44)~~ of calculating time of overlap between the audio frame to be reproduced last and the audio frame to be reproduced first so as to include the connection time; and

a ~~fifth~~ sixth step ~~(S45)~~ of recording a flag indicative of an audio multiplex state under control of the fourth step onto the recording medium together with the video object obtained by multiplexing under the control of the fourth step, and recording at least the overlap time as management information onto the recording medium ~~(41)~~.

17.   (currently amended) An audio/video reproducing apparatus for reproducing video data and audio data on the basis of a reproduction sequence from a recording medium ~~(51)~~ on which a video object and the reproduction sequence are recorded by a recording apparatus according to claim 15, comprising:

overlap time reproducing means ~~(52)~~ that reproduces the overlap time from the recording medium ~~(51)~~;

offset time calculating means ~~(58)~~ that sets the overlap time reproduced from the recording medium as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the connection point is the first connection point in the reproduction sequence, calculates a value obtained by adding the overlap time reproduced from the recording medium and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the connection point is any of the second and subsequent connection points in the reproduction sequence, and outputs an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame

to be reproduced last in the video object at the time of connection under a predetermined condition;

resetting means (57) that resets a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

offset means (57, 55) that offsets PTS of an audio frame ~~read~~ reproduced from the recording medium (51) in accordance with the calculated audio PTS offset time;

video data reproducing means (54) that reproduces video data reproduced from the recording medium (51) in accordance with video PTS accompanying the video data;

audio frame reproducing means (55) that reproduces an audio frame reproduced from the recording medium (51) in accordance with the offset PTS and, when the audio drop flag shows the predetermined value, controls so as not to reproduce an audio frame to be reproduced last in the video object; and

audio decoding means (55 (15, 16, 17)) that performs decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio frame reproduced by the audio frame reproducing means (55) and outputs an audio signal.

18.   (currently amended) The audio/video reproducing apparatus according to claim 17, wherein when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of audio frame time, the offset time calculating means (58) calculates a value obtained by subtracting the audio frame period from the audio PTS offset time as final audio PTS offset time, and outputs an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection.

19.   (currently amended) An audio/video reproducing method for reproducing video data and audio data on the basis of a reproduction sequence from a recording medium (51) on which a video object and a reproduction sequence are recorded by a recording method according to claim 16, comprising:

a first step of reproducing the overlap time from the recording medium;

a second step (S52) of setting the overlap time reproduced from the recording medium as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the connection point is the first connection point in the reproduction sequence, calculating a value obtained by adding the overlap time reproduced from the recording medium and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the connection point is any of the second and subsequent connection points in the reproduction sequence, and outputting an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection under a predetermined condition;

a third step (S53) of resetting a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

a fourth step (S53) of offsetting PTS of an audio frame read reproduced from the recording medium (51) in accordance with the audio PTS offset time calculated in the second step (S52);

a fifth step (S54) of reproducing video data that is reproduced from the recording medium (51) in accordance with video PTS accompanying the video data;

a sixth step (S54, S55) of reproducing an audio frame that is reproduced from the recording medium (51) in accordance with the PTS which is offset in the fourth step (S53) and, when the audio drop flag that is output in the third step (S53) shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

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a seventh step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio frame reproduced in the sixth step (S54 and S55) and outputting an audio signal.

20. (currently amended) The audio/video reproducing method according to claim 19, wherein in the second step (S52), when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of audio frame time, a value obtained by subtracting the audio frame period from the audio PTS offset time is calculated as final audio PTS offset time, and an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection is output.

21. (currently amended) An audio/video reproducing program for making a computer execute a reproducing method of reproducing video data and audio data on the basis of a reproduction sequence from a recording medium (51) on which a video object and the reproduction sequence is recorded by a recording method according to claim 16, wherein the program makes the computer execute:

a first step of reproducing the overlap time from the recording medium;

a second step (S52) of setting the overlap time reproduced from the recording medium as audio PTS offset time to be used at the time of reproducing an audio frame of the following video object when the connection point is the first connection point in the reproduction sequence, calculating a value obtained by adding the overlap time reproduced from the recording medium and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present edition point when the connection point is any of the second and subsequent connection points in the reproduction sequence, and outputting an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection under a predetermined condition;

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a third step (S53) of resetting a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

a fourth step (S53) of offsetting PTS of an audio frame read reproduced from the recording medium (51) in accordance with the audio PTS offset time calculated in the second step;

a fifth step (S54) of reproducing video data that is reproduced from the recording medium (51) in accordance with video PTS accompanying the video data;

a sixth step (S54, S55) of reproducing audio data that is reproduced from the recording medium (51) in accordance with the PTS which is offset in the fourth step (S53) and, when the audio drop flag that is output in the third step (S53) shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

a seventh step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio data frame reproduced in the sixth step (S54 and S55) and outputting an audio signal.

22.   (currently amended) An audio/video recording apparatus for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (61), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (61) so that the reproduction sequence can be designated, comprising:

audio encoding means (64 (11, 12, 13)) that performs encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputs the audio data;

video data changing means (69, 64, 63) that changes the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

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edition point determining means (66) that determines an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames and a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

multiplexing means that multiplexes the audio data and the video data to generate the video object;

control means that controls the multiplexing means so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size, and generates a flag indicative of an audio multiplex state at the time of multiplexing by the multiplexing means;

overlap time calculating means (67) for calculating time of overlap between the audio frame to be reproduced last and the audio frame to be reproduced first so as to include the connection time;

offset time calculating means (68) for, when the connection point is the first connection point in the reproduction sequence, setting the overlap time as audio PTS offset time used at the time of reproducing an audio frame in the video object and, when the connection point is any of the second and subsequent connection points in the reproduction sequence, calculating a value obtained by adding the overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present connection point; and

recording means (63) that records the video object output from the multiplexing means controlled by the control means onto the recording medium together with a flag indicative of the audio multiplex state generated by the control means, and records at least the overlap time and the audio PTS offset time as management information onto the recording medium (61).

23.   (currently amended) The audio/video recording apparatus according to claim 22, wherein when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of an audio frame period, the offset time calculating means (68) calculates a value obtained by subtracting the audio frame period from the audio PTS offset time as final audio PTS offset time and outputs an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection, and the recording means (63) records the audio PTS offset time and the audio drop flag as the management information onto the recording medium (61).

24.   (currently amended) An audio/video recording method for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (61), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (61) so that the reproduction sequence can be designated, comprising:

a first step of performing encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputting the audio data;

a second step (S62) of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

a third step (S63) of determining an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames and a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

a fourth step of controlling so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size at the time of multiplexing the audio data and the video data;

a ~~fourth~~ fifth step ~~(S64)~~ of calculating time of overlap between the audio frame to be reproduced last and the audio frame to be reproduced first so as to include the connection time;

a ~~fifth~~ sixth step ~~(S65)~~ of, when the connection point is the first connection point in the reproduction sequence, setting the overlap time as audio PTS offset time used at the time of reproducing an audio frame in the video object and, when the connection point is any of the second and subsequent connection points in the reproduction sequence, calculating a value obtained by adding the overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present connection point; and

a ~~sixth~~ seventh step ~~(S66)~~ of recording a flag indicative of an audio multiplex state under control of the fourth step onto the recording medium together with the video object obtained by multiplexing under the control of the fourth step, and recording at least the overlap time and the audio PTS offset time as management information onto the recording medium ~~(61)~~.

25.   (currently amended) An audio/video recording method according to claim 24, wherein in the fifth step ~~(S65)~~, when the audio PTS offset time at the calculated connection point is longer than a period of "n" times (where n is 1 or 1/2) of an audio frame period, a value obtained by subtracting the audio frame period from the audio PTS offset time is calculated as final audio PTS offset time, and an audio drop flag of a predetermined value indicating that it is unnecessary to reproduce an audio frame to be reproduced last in the video object at the time of connection is output and, in the sixth step ~~(S66)~~, the audio PTS offset time and the audio drop flag are recorded as the management information onto the recording medium ~~(61)~~.

26.   (currently amended) An audio/video reproducing apparatus for reproducing video data and audio data on the basis of a reproduction sequence from a recording medium (71) on which a video object and the reproduction sequence is recorded by a recording apparatus according to claim 22 or 23, comprising:

resetting means (77) that resets a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

offset means (77, 75) that offsets PTS of an audio frame ~~read~~ reproduced from the recording medium (71) in accordance with the audio PTS offset time which is ~~read~~ reproduced from the recording medium (71);

video data reproducing means (74) that reproduces video data reproduced from the recording medium (71) in accordance with video PTS accompanying the video data;

audio data reproducing means (75) that reproduces audio data reproduced from the recording medium (71) in accordance with the offset PTS;

drop processing means (77) that, when the audio drop flag reproduced from the recording medium (71) shows the predetermined value, controls so as not to reproduce an audio frame to be reproduced last in the video object; and

audio decoding means (75 (15, 16, 17)) that performs decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio data reproduced by the audio data reproducing means and outputs an audio signal.

27.   (currently amended) An audio/video reproducing method for reproducing video data and audio data on the basis of a reproduction sequence from a recording medium (71) on which a video object and the reproduction sequence is recorded by a recording ~~apparatus~~ method according to claim ~~22~~ 24 or ~~23,~~ 25 comprising:

a first step ~~(S72)~~ of resetting a system time clock ~~(STC)~~ of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

a second step ~~(S72)~~ of offsetting PTS of an audio frame ~~read~~ reproduced from the recording medium ~~(71)~~ in accordance with the audio PTS offset time which is ~~read~~ reproduced from the recording medium ~~(71)~~;

a third step ~~(S73)~~ of reproducing video data reproduced from the recording medium ~~(71)~~ in accordance with video PTS accompanying the video data;

a fourth step ~~(S73)~~ of reproducing audio data reproduced from the recording medium ~~(71)~~ in accordance with the offset PTS;

a fifth step ~~(S74)~~ of, when the audio drop flag reproduced from the recording medium ~~(71)~~ shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

a sixth step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio data reproduced in the fourth step ~~(S73)~~.

28.   (currently amended) An audio/video recording program product for making a computer execute a recording method for, at the time of recording a set of synchronized video data and audio data as a video object onto a recording medium (61), recording a reproduction sequence for connecting and reproducing a plurality of video objects in part or in whole onto the recording medium (61) so that the reproduction sequence can be designated, ~~wherein the~~

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~~program makes~~ comprising a non-transitory computer memory store or medium with instructions for causing the computer to execute:

a first step of performing encoding including a window function multiplying process and an orthogonal transformation process on an audio signal to be recorded and outputting the audio data;

a second step ~~(S62)~~ of changing the video data as necessary so that a video frame to be reproduced last in a video object and a video frame to be reproduced first in the following video object are reproduced seamlessly at a connection point;

a third step ~~(S63)~~ of determining an edition point in the audio frame so that a period of reproducing an audio frame to be reproduced last in the video object includes time of the connection point of the video frames and a period of reproducing an audio frame to be reproduced first in the following video object includes the time of the connection point, and the period of reproducing an audio frame in the video object and the period of reproducing an audio frame in the following video object partly overlap each other around the connection point;

a fourth step of controlling so that an audio buffer occupation amount is equal to or less than a value obtained by subtracting a data amount of one audio frame from the upper limit of a specific audio buffer size at the time of multiplexing the audio data and the video data;

a ~~fourth~~ fifth step ~~(S64)~~ of calculating time of overlap between the audio frame to be reproduced last and the audio frame to be reproduced first so as to include the connection time;

a ~~fifth~~ sixth step ~~(S65)~~ of, when the connection point is the first connection point in the reproduction sequence, setting the overlap time as audio PTS offset time used at the time of reproducing an audio frame in the video object and, when the connection point is any of the second and subsequent connection points in the reproduction sequence, calculating a value obtained by adding the overlap time and audio PTS offset time at the immediately preceding connection point as audio PTS offset time at the present connection point; and

a ~~sixth~~ seventh step ~~(S66)~~ of recording a flag indicative of an audio multiplex state under control of the fourth step onto the recording medium together with the video object obtained by

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multiplexing under the control of the fourth step, and recording at least the overlap time and the audio PTS offset time as management information onto the recording medium (61).

29.   (currently amended) An audio/video reproducing program for making a computer execute a reproducing method of reproducing video data and audio data on the basis of a reproduction sequence from a recording medium (71) on which a video object and the reproduction sequence is recorded by a recording apparatus method according to claim 22 24 or 23 25, wherein the program makes the computer execute:

a first step (S72) of resetting a system time clock (STC) of the apparatus so as to seamlessly connect video frames to be connected at each of connection points of the video objects included in the reproduction sequence;

a second step (S72) of offsetting PTS of an audio frame read reproduced from the recording medium (71) in accordance with the audio PTS offset time which is read reproduced from the recording medium (71);

a third step (S73) of reproducing video data reproduced from the recording medium (71) in accordance with video PTS accompanying the video data;

a fourth step (S73) of reproducing audio data reproduced from the recording medium (71) in accordance with the offset PTS;

a fifth step (S74) of, when the audio drop flag reproduced from the recording medium (71) shows the predetermined value, controlling so as not to reproduce an audio frame to be reproduced last in the video object; and

a sixth step of performing decoding including a window function multiplying process and an orthogonal inverse transformation process on the audio data reproduced in the fourth step (S74).